

REMARKS

By this amendment, applicants have amended claim 5 to be in independent form by including therein all the limitations from claim 1 from which claim 5 previously depended. Accordingly, applicants have canceled claim 1 without prejudice or disclaimer of the subject matter contained therein and have amended the remaining claims to ultimately depend from claim 5.

The foregoing amendments place the application in condition for allowance for the reasons set forth hereinafter or, at least, in better form for consideration on appeal since the amendments reduce issues on appeal. Moreover, since the amendments merely rewrite claim 5 in independent form, cancel a claim and amend the dependency of claims, the amendments do not raise new issues requiring further consideration or search. Therefore, entry of this amendment under 37 C.F.R. §116 is requested.

In view of the foregoing amendments canceling claim 1 and amending claims 2, 3 and 14 to depend from claim 5, the rejection of claims 1 - 3 and 14 under 35 U.S.C. §102(b) as allegedly being anticipated by United States Patent No. 5,860,401 to Adachi et al is moot.

Claims 4 - 13 and 15 stand rejected under 35 USC 103(a) as allegedly being unpatentable over Adachi et al. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to a method for increasing the wear resistance of a work piece. According to the present invention, the work piece is connected to a core material that cannot be reshaped and which is of greater hardness than the work piece material. The core material is

connected to the work piece in a form-fitting manner by means of cold-extrusion or hot-extrusion of the work piece material. The core material has additional shaped elements provided on a peripheral surface of the core material for securing the core material against torsion in the work piece.

The patent to Adachi et al discloses a valve seat 46 formed from an insert ring, indicated generally by the reference numeral 67 which is bonded in place into the basic cylinder head material 42. A metallurgical bond is formed at the interface between the insert ring 67 and the base cylinder head material 42. See, e.g., column 6, lines 49 - 54 of Adachi et al. As can be seen in Figure 16 and the accompanying description, a solidus diffusion layer is formed by the bonding method. Thus, while the Adachi et al patent describes a metallurgical bond (i.e., a pure substance fitting), the work piece is connected to the core material according to the present invention in a form-fitting manner by means of cold-extrusion or hot-extrusion of the work piece. Moreover, the shape of the core material is important to secure the core material against torsion in the work piece when cold extrusion or hot-extrusion is used to connect the work piece to the core material. The Adachi et al patent does not disclose a core material having the claimed shape, i.e., a core material having additional shaped elements provided on a peripheral surface of the core material for securing the core material against torsion in the work piece. Applicants submit the claimed shape for the core material would not be necessary when using the bond described in Adachi et al. Accordingly, it would not have been obvious to provide the core material in the claimed shape based on the teachings of Adachi et al.

The Examiner dismisses many of the claimed features (including the additional shaped elements provided on a peripheral surface of the core material for securing the core material against torsion in the work piece as set forth in independent claim 5) as design limitations "held to be obvious and not given patentable weight in these method of manufacturing claims as such limitation(s) do not result in any difference in the *claimed* manufacturing process." In the first place, the various features recited in claim 5 and the dependent claims do result in a difference in the claimed manufacturing process from that described in Adachi et al. Certainly, the type and shape of core material and the apparatus used to carry out the method have a direct relationship to the claimed manufacturing process. A process (such as that described in Adachi et al) that does not use the claimed core material or the claimed processing apparatus is, quite simply, a different process.

Moreover, dismissing the features of the dependent claims as "design limitations" and holding the same to be obvious without any evidence that they would have been obviousness does not fulfill the obligation of the Patent and Trademark Office to provide reasoned decision-making in connection with the obvious issue under 35 USC 103. See In re Lee, 277 F.3d 1338, 61 USPQ 2d, 430 (Fed. Cir. 2002).

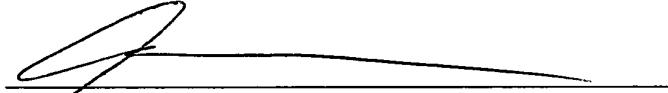
For the foregoing reasons, it is submitted claims 2 -15 are patentable over Adachi et al.

In view of the foregoing amendments and remarks, entry of this amendment and favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 306.38372X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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2. (Amended) Method according to claim 15, characterized in that the work-piece material is steel or non-ferrous metal.

3. (Twice Amended) Method according to claim 15, characterised in that the core material is a hard metal or a hardened metal.

4. (Twice Amended) Method according to claim 15, characterised in that the core material is a ceramic sintered material.

5. (Twice Amended) ~~Method according to claim 1, characterised in that A method for increasing the wear-resistance of a work piece, comprising connecting the work piece to a core material that cannot be reshaped and which is of a greater hardness than the work-piece material in a form-fitting manner by means of cold-extrusion or hot-extrusion of the work-piece material wherein, the core material has additional shaped elements provided on a peripheral surface of the core material for securing the core material against torsion in the work piece.~~

7. (Twice Amended) Method according to claim 15, characterised in that the core material tapers towards an outside of the work piece.

8. (Twice Amended) Method according to claim 15, characterised in that a bore in which a displaceable punch connects the work piece to the core material is arranged in an extrusion sleeve liner.

14. (Twice Amended) Method according to claim 15, characterised in that the work piece is a work piece of a valve system for internal combustion engines.